

CASE STUDY

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The Wakil Kesihatan Kampung programme as a community health volunteer model for improving rural healthcare access in Sarawak Malaysia

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Abstract

Background Health inequities between urban and rural populations remain a persistent global challenge, particularly in geographically isolated regions. In Sarawak, Malaysia, access to healthcare is constrained by terrain, infrastructure, and workforce limitations. Community health worker (CHW) models have been widely adopted to bridge such gaps. The Wakil Kesihatan Kampung (WKK) programme, established in 1981, represents one of Malaysia's earliest community-based health volunteer initiatives.

Methods This study adopts a descriptive case study and historical analysis approach. Data were obtained from WKK programme guidelines, government reports, published literature, and experiential insights from programme implementation. A thematic analysis was conducted focusing on programme development, roles, achievements, and sustainability challenges.

Results The WKK programme has contributed to improved healthcare access in rural Sarawak through health promotion, early disease detection, basic care provision, and facilitation of referrals. At its peak, over 2,600 volunteers served rural communities. The programme enhanced health literacy, strengthened community engagement, and improved linkage to formal healthcare services. However, the number of active WKK declined to 644 in 2023 due to infrastructural development, workforce expansion, and reduced volunteer participation.

Conclusion The WKK programme demonstrates the continued relevance of community-based health volunteer models in addressing rural health inequities. Sustained impact requires structured funding, policy support, and integration into formal health systems. Future roles may include non-communicable disease management, digital health support, and disaster preparedness.

Keywords Rural health, Community health workers, Health equity, Sarawak, Village health volunteers



1 Introduction

Health inequity between urban and rural populations remains a major global concern, particularly in regions with geographic and infrastructural challenges. Rural populations often experience reduced access to healthcare services, delayed treatment, and poorer health outcomes compared to their urban counterparts [1]. Community health worker (CHW) programmes have been widely implemented across different regions as a cost-effective and culturally appropriate strategy to improve healthcare access and equity. The World Health Organization (WHO) recognizes CHWs as a critical component of primary healthcare systems and a key driver toward achieving universal health coverage (UHC) [2]. Evidence from countries such as Rwanda and Vietnam demonstrates that CHWs can improve early detection, enhance health literacy, and strengthen community engagement in healthcare delivery [3].

In Malaysia, despite a relatively well-developed healthcare system, disparities persist in rural and remote regions. Sarawak, the largest state in Malaysia, presents unique challenges due to its vast geographical area, dispersed populations, and limited accessibility. Historically, many communities were only reachable via river transport, logging roads, or air services [4]. To address these challenges, the Sarawak State Health Department introduced the Wakil Kesihatan Kampung (WKK) programme in 1981. The programme trains selected community members to serve as village health volunteers, providing basic health services and acting as intermediaries between communities and healthcare providers [5].

Several other community-based health initiatives have been implemented to strengthen public health delivery through community participation. The Komuniti Sihat Pembina Negara (KOSPEN) programme, introduced in 2013, utilizes trained community volunteers as “health agents of change” to promote healthy lifestyles, conduct screening for non-communicable diseases, and facilitate early referrals. Similarly, the MyCHAMPION initiative represents a more recent effort to develop community health influencers who support health promotion and behavioural change at the grass-roots level. These programmes reflect a broader national strategy to empower communities and extend healthcare services beyond conventional facilities. Within this context, the WKK programme represents an earlier and more rural-focused model, specifically designed to address geographic barriers and improve healthcare accessibility in remote areas of Sarawak.

This paper aims to critically examine the WKK programme, including its development, roles, achievements, and challenges, while situating it within the broader global context of community-based healthcare delivery.

2 Methods

This study adopts a qualitative descriptive case study design combined with historical analysis. Data sources included:

- WKK Guideline (4th Edition), Sarawak State Health Department [5]
- Government and programme reports
- Peer-reviewed literature on CHW programmes

- Observational and experiential insights from programme implementation by author while handling the programme
- Secondary data from academic publications

A thematic analysis approach was employed to synthesise findings across key domains: programme development, roles and contributions, impact, and sustainability challenges. This approach aligns with established qualitative methodologies used in health systems research [6]. Programme documents were purposively retrieved from materials held by the Sarawak State Health Department and programme-related institutional records, including the WKK guideline, available programme summaries and relevant government or departmental reports. Peer-reviewed literature was identified through targeted searches of PubMed, Scopus and Google Scholar using combinations of the terms “community health worker”, “village health volunteer”, “rural health”, “primary health-care”, “health equity”, “Sarawak”, “Malaysia”, “non-communicable disease”, and “community-based health programme”. Reference lists of relevant articles were also screened to identify additional sources. Documents and articles were included if they provided information on the development, implementation, roles, outcomes or sustainability of community health worker or village health volunteer programmes, particularly in rural or underserved settings. Because this study was designed as a descriptive case study and historical analysis rather than a systematic review, the search process was purposive and narrative in nature.

2.1 History and development of WKK programme

The WKK programme was first introduced in 1981 in Serian Division, Sarawak, with the training of the first cohort at Tebakang Polyclinic as shown in Fig. 1. The programme expanded progressively across districts due to its effectiveness in improving community-level healthcare access.

Formalization occurred in 1987 with the introduction of structured training guidelines. Over time, training modules expanded to include communicable disease control, maternal and child health, environmental sanitation, oral health, and non-communicable disease (NCD) awareness [5].

The programme gained international recognition from UNICEF in 2006 for its contribution to rural health improvement. By 2020, the programme reached its peak with approximately 2,657 active WKK volunteers across Sarawak.



Fig. 1 The first cohort of WKK and their pilot training at Tebakang polyclinic, Serian, Sarawak



Fig. 2 The second cohort of WKK and their training at Sambir polyclinic, Samarahan. Those WKK will serve the rural villagers under Samarahan Division, Sarawak after completed their training



Fig. 3 The first Sarawak WKK Convention held at Kingwood Hotel, Sibul, Sarawak in 2016

The second cohort consist of 12 WKK as shown in Fig. 2.

In 2016, WKK programme was having their first state level convention as shown in Fig. 3.

The selection of WKKs is grounded in the principle of community trust, whereby volunteers are typically respected members of the village who possess basic literacy, demonstrate good moral character, and exhibit a strong willingness to serve their local communities. At its inception, the training modules were relatively simple and foundational in nature. However, as the WKK programme evolved, the scope of training expanded substantially to encompass a broad spectrum of public health domains. The programme is conceptually grounded in primary health care and community empowerment, consistent with the Alma-Ata “Health for All” approach and wider WHO guidance on community health worker programmes. The fourth edition of the WKK guidebook further reflects this progression by incorporating contemporary public health challenges and updated evidence-based practices, as illustrated in Fig. 4.

2.2 Roles and contributions of WKK

WKK volunteers play a multifaceted role in supporting rural healthcare delivery. Their training covers practical public health domains including communicable disease control, non-communicable disease awareness, environmental health, oral health, health education (Fig. 5), basic screening (Fig. 6), early referral and reporting of health-related events. In practice, WKK volunteers support health talks, basic screening, recognition of



Fig. 4 The 4th edition of WKK guidebook for WKK and their trainers



Fig. 5 A WKK was conducting a health talk to villagers in his village



Fig. 6 A WKK is measuring the blood pressure of a villager in a longhouse in rural Sarawak



Fig. 7 Geographical coverage of the Wakil Kesihatan Kampung (WKK) programme in Sarawak, Malaysia

danger signs, simple emergency assistance and community mobilization for preventive activities.

These contributions are consistent with global CHW roles and have been shown to improve access to care and health outcomes [3].

The map as shown in Fig. 7 illustrates the distribution of WKK services across all 12 major divisions in Sarawak, including rural and remote areas with limited access to healthcare facilities. The programme predominantly serves geographically isolated communities, including longhouses and riverine settlements.

2.3 Achievements and impact

The WKK programme has demonstrated meaningful contributions to healthcare access and community engagement in rural Sarawak. Programme data indicate that WKK volunteers have served approximately 328,933 individuals across 1,655 villages, highlighting their extensive reach in geographically isolated areas [7]. Through health education, basic screening and early identification of health risks, WKK volunteers facilitate timely referral to healthcare services and help reduce delays in care-seeking [7]. Their position as trusted members of the community also strengthen the linkage between rural populations and formal healthcare providers. These findings should be interpreted as programme-level evidence of reach, service facilitation and community engagement, rather than as direct quantitative evidence of measurable health outcome improvement.

Similar outcomes have been observed in CHW programmes globally, including in Rwanda and Vietnam, where community-based models improved service delivery and equity [8, 9]. An unpublished evaluation conducted by the Institute for Medical Research in 1999 was used as supporting programme documentation for several reported achievements of the WKK programme, particularly improved service accessibility, increased community participation in health activities, improved health awareness and facilitation of referral to health facilities [10]. However, because the report is unpublished, its findings are presented cautiously and are not treated as independently verified quantitative evidence of health outcome improvement.

Examples from programme documentation and field implementation suggest that the WKK programme contributed to practical community-level health improvements. These include increased acceptance of treated pipe water in some rural communities, improved awareness of communicable disease risks such as dengue, and better recognition of warning signs such as high fever and gum bleeding. WKK volunteers also supported community participation in preventive activities, including basic blood pressure screening and early advice to seek care for prolonged cough as part of tuberculosis awareness.

3 Current status of WKK in Sarawak

The number of WKK volunteers declined significantly from 2,657 in 2020 to 644 in 2023. Several factors contributed to this reduction:

- Improved infrastructure and accessibility in rural areas
- Expansion of formal healthcare workforce and facilities in rural areas
- Urban migration among younger populations
- Lack of financial incentives and structured funding
- Reduced volunteer motivation

Additionally, the COVID-19 pandemic further contributed to the decline and disruption of the WKK programme as reported in similar CHW programmes globally [11]. Movement restrictions and public health control measures limited face-to-face community engagement, resulting in reduced health promotion activities and suspension of outreach programmes. Recruitment and training of new WKK volunteers were also affected, as training sessions were postponed and community mobilisation activities were restricted. In addition, fear of infection and lack of adequate protective resources reduced volunteer participation and motivation. Similar disruptions to community

health worker programmes have been reported globally, where routine services were scaled down and resources were redirected toward pandemic response. Despite these challenges, the pandemic also highlighted the potential role of community-based volunteers in surveillance, risk communication, and community engagement, suggesting that stronger integration of WKK into emergency preparedness frameworks may enhance future health system resilience.

3.1 Challenges in sustaining the programme

Since the beginning of the programme, various hardship faced.

3.1.1 Financial constraint

Financial constraints remain a major challenge to the sustainability of the WKK programme. Consistent funding is needed for initial training, refresher training, supervision, operational support, educational materials, transport and modest allowances for volunteers. Although the volunteer-based model has allowed the programme to function at relatively low cost, rising living expenses and competing livelihood demands may reduce motivation and long-term retention. Without structured financial support, the programme risks becoming dependent on the goodwill of a shrinking pool of volunteers, which may affect continuity and quality of service delivery.

3.1.2 Volunteer recruitment and retention

Volunteer-based systems face increasing difficulty in sustaining long-term engagement, particularly among younger populations. On top of that, younger generation is migrating to town area in view of higher chance for better quality of life [12, 13]. All this affecting the sustainability of WKK programme. Strategies to overcome such challenge including retired civil servants from the villages as pensioners have fixed monthly income and their literacy level is very helpful as liaison officers and WKK in bridging the villagers and healthcare agencies.

3.1.3 Geographic and logistic barriers

Supervision and continuous training remain significant challenges in remote settings with limited infrastructure and poor communication networks, mirroring constraints experienced by flying doctor and mobile health services in Sarawak [14, 15]. These challenges are further compounded by high operational costs and adverse weather conditions. Addressing these barriers requires context-specific strategies, including the engagement of locally knowledgeable off-road drivers, strategic partnerships with non-governmental organisations for resource optimisation, and active involvement of community leaders to facilitate access to hard-to-reach populations.

3.1.4 Training and standardization of care

Accessibility alone is insufficient if the quality of care is compromised, as this may ultimately undermine programme effectiveness. Continuous training and retraining are therefore essential to maintain the competency of WKKs. These programmes ensure that WKKs are equipped with updated knowledge and skills, delivered by accredited and experienced healthcare professionals. In addition, the development of structured

resources, such as the WKK guidebook, provides clear direction and strengthens the overall objectives of the programme.

4 Discussion and perspectives

The WKK programme illustrates the continuing importance of community-based healthcare models in addressing rural health inequities. Similar community health worker programmes globally have demonstrated effectiveness in improving access, reducing delays in care and strengthening links between communities and formal health systems [2, 3]. However, the WKK experience also shows that programme relevance and sustainability depend on continuous adaptation to changing health system needs, demographic shifts and community expectations.

International evidence provides useful comparison for interpreting the WKK experience. In Rwanda, community health workers have contributed to improved access and equity in service delivery, while studies from Vietnam demonstrate the potential role of village health workers in non-communicable disease prevention and control [8, 9]. These examples should not be interpreted as direct evidence of WKK effectiveness, but they support the broader argument that well-supported community health worker models can strengthen primary healthcare in underserved settings.

Sustainability remains one of the most critical challenges facing the WKK programme. The current volunteer-based model, while cost-effective, is inherently vulnerable to declining participation, particularly in the absence of structured financial support and formal recognition [16]. The substantial reduction in WKK numbers from 2,657 in 2020 to 644 in 2023 highlights the fragility of relying on unpaid community volunteers. In addition, demographic shifts, including rural-to-urban migration among younger populations, further limit recruitment, and long-term retention.

Another key limitation is the lack of formal integration of WKK into the healthcare system. Without structured supervision, defined roles, and clear career pathways, the programme risks being perceived as supplementary rather than essential [17]. Global evidence suggests that community health worker programmes are more sustainable when supported by consistent funding, training, and integration into primary healthcare systems [17].

Furthermore, improvements in infrastructure and healthcare accessibility may paradoxically reduce the perceived need for WKK, despite the continued presence of underserved and geographically isolated populations. This highlights the need to redefine the role of WKK within the evolving healthcare landscape. Strengthening sustainability will require a transition from a purely volunteer-based model toward a more structured and supported system, including incentives, continuous training, and policy integration [17].

4.1 Future roles and perspectives of WKK

In the evolving healthcare landscape, WKK volunteers have the potential to serve as an extension of primary healthcare in rural settings by supporting early detection, health education and facilitation of care [18]. Their role is particularly relevant for non-communicable disease prevention [19], disease surveillance, digital health support and emergency preparedness in geographically isolated areas. For example, WKK volunteers could assist with blood pressure monitoring, lifestyle education, early referral, risk communication during outbreaks, support for telehealth appointments and

community-based reporting during disasters or public health emergencies. Maximizing this potential will require greater system integration, structured training, supportive supervision and sustained resources, as reliance on a purely volunteer-based model may limit long-term effectiveness.

5 Conclusion

The WKK programme represents a long-standing community-based approach to addressing rural health inequities in Sarawak. Available programme data indicate that WKK volunteers have reached a substantial number of rural residents across geographically isolated communities, contributing to improved access to basic healthcare services, enhanced health literacy, and earlier identification and referral of health conditions. These contributions are consistent with global evidence on the effectiveness of community health worker models in improving access and supporting primary healthcare delivery. However, robust quantitative evaluation of health outcomes remains limited, and the sustainability of the programme is challenged by declining volunteer numbers and resource constraints. Strengthening policy support, structured training, and integration into the formal health system will be essential to maximize the long-term impact of the programme.

5.1 Limitations

This study has several limitations. First, it is primarily descriptive and relies on secondary data, programme documentation and experiential insights from programme implementation. Second, as the document retrieval process was purposive rather than systematic, some relevant documents, particularly unpublished local programme records or district-level reports, may have been missed. Third, the available evidence is strongest for programme reach, service facilitation, community engagement and descriptive achievements. Robust quantitative evaluation of direct health outcomes, referral completion, morbidity reduction, cost-effectiveness and long-term community-level impact remains limited. Fourth, the use of unpublished programme reports, including the 1999 IMR evaluation, limits external verification of some reported achievements. Future research should include formal programme evaluation using standardized indicators and mixed-methods approaches to better measure effectiveness, sustainability and health system impact.

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Author contributions

L.S.H. conceptualized the manuscript and led the writing. S.F.J., N.R.S., and W.J. contributed to data compilation, historical review, and field insights. R.N. and T.A. provided critical review and intellectual input. All authors read and approved the final manuscript.

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Data availability

No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate

This study received institutional clearance from the Ethics Committee of Universiti Malaysia Sarawak (UNIMAS). The study was based on secondary data, programme documentation and historical analysis, and did not involve direct recruitment of human participants.

Consent for publication

Consent for publication was obtained from the relevant authorities for the use of programme-related materials and images included in the manuscript.

Competing interests

The authors declare no competing interests.

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